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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/715,629	11/18/2000	Kunihiro Watanabe	3120/FLK	7785

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EXAMINER

MOE, AUNG SOE

ART UNIT PAPER NUMBER

2612

DATE MAILED: 03/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/715,629

Applicant(s)

WATANABE ET AL.

Examiner

Aung S. Moe

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-5 and 11 is/are allowed.
- 6) ☒ Claim(s) 6-10 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3 & 4.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

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DETAILED ACTION

Claim Rejections - 35 USC § 112

1. Claims 8 and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 8 recites the limitation "said light emitting means" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim.

Claim 10 is rejected for being dependent on the rejected claim 8.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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4. Claim 6 is rejected under 35 U.S.C. 102(b) as being anticipated by Kamasz et al. (U.S. 5,585,652).

Regarding claim 6, Kamasz '652 discloses a solid-state imaging device for use in a solid state imaging apparatus (Fig. 2; col. 1, lines 10+, and col. 5, lines 25+), the device comprising:

means for receiving an incident light to thereby generate charges (i.e., the sensor 212), the receiving means having one or more photoelectric conversion elements (214);

first accumulation means (i.e., noted the first frame of photo-charges generated during the first sample time provided by the timing control unit 226), in response to a first control signal (i.e., the control time "t1-t3", for accumulating the charges generated from each of the photoelectric conversion elements (214/312), the first accumulation means having one or more charge accumulation devices (i.e., noted that the charges accumulated in the pixels 300-306 and further stored in the respective storage device 316; see Figs. 3A-3C);

second accumulation means (i.e., noted the second frame of photo-charges generated during the first sample time provided by the timing control unit 226), in response to a second control signal (i.e., the control time "t3-t4"), for accumulating the received charges generated from each of the photoelectric conversion elements (300-306), the second accumulation means having one or more charge accumulation devices (i.e., noted that the charges accumulated in the pixels 300-306 and further stored in the respective storage device 316; see Figs. 3A-3C);

first transfer means for transferring the charges accumulated in the first charge accumulation means in a serial sequence as a first charge signal (i.e., noted that the charges B1-B4 accumulated during the first frame are transferred in a serial sequence during the time periods t1-t3 as first frame signal as shown in Figs. 3A-3C);

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second transfer means for transferring charges accumulated in the second charge accumulation means in a serial sequence as a second charge signal (i.e., noted that the charges B1-B4 accumulated during the first frame are transferred in a serial sequence during the time periods t3-t4 as first frame signal as shown in Figs. 3D-3F);

control means for outputting the first control signal **or** the second control signal to select the first **or** the second charge accumulation means (i.e., noted that the clock unit 226 is capable of controlling the sensor to output the first frame of charges and second frame of charges accumulated by providing the respective control signals), thereby allowing the charges to be accumulated in the first **or** the second charge accumulation means, respectively (i.e., noted that the clock unit 226 is capable of controlling the sensor to accumulate the first frame of charges and second frame of charges by providing the respective control signals; see Figs. 3A-3G); and

means for calculating a difference (i.e., noted the differential output amplifier as shown in Figs. 2 and 7 at the output of the imaging device for calculating a difference of the first frame and second frame signals; see col. 1, lines 50+, col. 7, lines 5-55) between the first charge signal and the second charge signal to thereby output a differential signal in sequence (col. 9, lines 15-50).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 6, 7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagura (U.S. 5,025,318) in view of Leacock et al. (U.S. 5,398,060).

Regarding claim 6, Nagura '318 discloses a solid state imaging device (Figs. 2, 4 and 6) for use in a solid state imaging apparatus (i.e., col. 1, lines 20+), the device comprising:

means for receiving an incident light to thereby generate charges (col. 2, lines 38+), the receiving means having one or more photoelectric conversion elements (the photo-sensor array 2);

first accumulation means (i.e., accumulating the odd-charges in the respective sensors), in response to a first control signal (i.e., noted the odd-number charges read control signals as shown in Figs. 3A-3B; col. 3, lines 5+), for accumulating the charges generated from each of the photoelectric conversion elements (2), the first accumulation means having one or more charge accumulation devices (i.e., noted the photo-sensor array 2);

second accumulation means (i.e., accumulating the even-charges in the respective sensors; see Figs. 3A-3B), in response to a second control signal (i.e., noted the even-number

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charges read control signals as shown in Figs. 3A-3B; col. 3, lines 5+), for accumulating the received charges generated from each of the photoelectric conversion elements (i.e., the sensor array 2), the second accumulation means having one or more charge accumulation devices (i.e., noted the photo-sensor array 2);

first transfer means (i.e., the transfer register 3a) for transferring the charges accumulated in the first charge accumulation means (i.e., the image data accumulated in the odd-numbered photo-sensor elements) in a serial sequence as a first charge signal (i.e., see col. 3, lines 20+);

second transfer means (i.e., the transfer register 3b) for transferring charges accumulated in the second charge accumulation means (i.e., the image data accumulated in the even-numbered photo-sensor elements) in a serial sequence as a second charge signal (i.e., see col. 3, lines 20+);

control means (i.e., noted the control unit 4) for outputting the first control signal (i.e., the control clock for the odd-numbered Photosensitive elements) **or** the second control signal (i.e., the control clock for the even-numbered Photosensitive elements) to select the first **or** the second charge accumulation means (i.e., the charges accumulated in either Odd-numbered Photosensitive elements or Even-numbered Photosensitive elements), thereby allowing the charges to be accumulated in the first **or** the second charge accumulation means, respectively (col. 2, lines 55+).

Furthermore, although Nagura '318 show the calculating means (i.e., the Figs. 2, the elements 7-10) for the first charge signal and the second charge signals at the output of the solid-state imaging device (1), Nagura '318 does not explicitly show means for calculating a

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difference between the first charge signal and the second charge signals to thereby output a differential signal in sequence.

However, the above-mentioned claimed limitations are well known in the art as evidenced by Leacock '060. In particular, Leacock '060 teaches that it is conventionally well known in the art at the time of the invention was made to use means for calculating a difference (Fig. 2, the element 102/106) between the first charge signal (CCD out 1) and the second charge signal (i.e., CCD out 2) to thereby output a differential signal in sequence (i.e., see col. 3, lines 40+).

In view of the above, having the system of Nagura '318 and then given the well-established teaching of Leacock '060, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Nagura '318 as taught by Leacock '060, since Leacock '060 suggested in col. 2, lines 5+ that such a modification would increase the reliability of noise reduction function on multiple phased outputs of the imaging device.

Regarding claim 7, the combination of Nagura '318 and Leacock '060 discloses wherein each charge accumulation device in the first accumulation means (i.e., the Odd-numbered photosensitive elements of Nagura '318; and CCD1 of Leacock '060 as shown in Fig. 1) and the second accumulation means (i.e., the Even-numbered photosensitive elements of Nagura '318; and CCD2 of Leacock '060 as shown in Fig. 1) is prepared for each corresponding photoelectric conversion element (i.e., the sensor 2 of Nagura '318; and the CCD sensor of Leacock '060 as shown in Fig. 1).

Regarding claim 9, the combination of Nagura '318 and Leacock '060 discloses wherein the charges accumulated in the first and second accumulation means (i.e., Fig. 2 of Nagura '318) are fed en bloc to the first and second transfer means (i.e., the shift register 3a/3b of Nagura '318; and V-CCD of Leacock '060 as shown in Fig. 1), respectively; the first and the second transfer means transfer the charges in series (i.e., see Figs. 3A-3B and 5A-5B of Nagura '318; and Figs. 4A-4B of Leacock '060); and at the same time, the first and the second accumulation means accumulate the charges therein (i.e., see Figs. 3A-3B and 5A-5B; col. 3, lines 15+ and col. 4, lines 49+ of Nagura '318; and Figs. 4A-4B of Leacock '060).

Allowable Subject Matter

8. Claims 1-5 and 11 are considered allowable over the prior art of record since prior art of record fails to show or fairly suggest all the limitation as recited in the claims 1-5 and 11.

9. Claim 10 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


a. Koch '557, Nagasaki '731, Fukui '546, Lagnado '602, Fukuda '490 and Maki '576 shown a solid-state imaging apparatus.

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11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aung S. Moe whose telephone number is 703-306-3021. The examiner can normally be reached on Mon-Fri (9-5).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy Garber can be reached on 703-305-4929. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Aung S. Moe
Primary Examiner
Art Unit 2612

A. Moe
March 19, 2004